

## **ECOSYSTEM-BASED MANAGEMENT INDICES AND INFORMATION**

### ***Ecosystem Goal: Maintain Diversity***

#### **Time Trends in Bycatch of Prohibited Species**

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The retention and sale of crab, halibut, herring, and salmon generally is prohibited in the groundfish fishery; therefore, these are referred to as prohibited species. The prohibition was imposed to reduce the catch or bycatch of these species in the groundfish fishery. A variety of other management measures have been used to control the bycatch of these species, and data from the groundfish observer program have been used to estimate the bycatch of these species and the bycatch mortality of halibut. Most of the groundfish catch and prohibited species bycatch is taken with trawl gear. The implementation of the halibut and sablefish IFQ programs in 1995 allowed for the retention of halibut in the hook and line groundfish fishery and effectively addressed an important part of the halibut bycatch problem in that fishery, but it also made it very difficult to differentiate between halibut catch and bycatch for part of the hook and line groundfish fishery. Therefore, the estimates of halibut bycatch mortality either for the hook and line fishery or for the groundfish fishery as a whole are not comparable before and after 1995.

Estimates of the bycatch of prohibited species other than halibut and estimates of halibut bycatch mortality are presented in Figure 111. Halibut bycatch is managed and monitored in terms of bycatch mortality instead of simply in terms of bycatch. This is done to provide an incentive for fishermen to increase the survival rate of halibut that are discarded. The survival rates for discarded salmon and herring are thought to approach zero and there is substantial uncertainty concerning the survival rates for discarded crab. Currently, the limited ability to control or measure survival rates for the other prohibited species makes it impracticable to manage and monitor their bycatch in terms of bycatch mortality.

Between 2002 and 2003, there were large increases in the bycatch of herring, “other king crab” (OKC) and “other salmon” (OS), with herring bycatch increasing by over 600% and the bycatch of both OKC and OS more than doubling.

Most of the herring bycatch in all years occurs in the BSAI trawl fisheries (98% in 2002, 99% in 2003 and 80% in 2004), primarily during the months of July, August and September with smaller amounts in January through March and October. After the dramatic increase in 2003, the herring bycatch increased again by about 42% in 2004. The recent rise in bycatch can be partly explained by increases of herring biomass; the biomass of Kuskokwim herring, for example, is estimated to have increased by about 34% in 2003 and again by about 32% in 2004. GIS maps of haul-by-haul observer data (which cannot be published because of confidentiality constraints) reveal differences in the distribution of both effort (all pelagic-trawl hauls) and bycatch (hauls with herring in the species composition) over the years 2002-04. In February, March, September and October of 2003 and in February, September and October of 2004, pelagic trawl activity and the resulting herring bycatch extended further to the northwest along the edge of the Bering Sea shelf than in the corresponding months of 2002; bycatch events occurred between 200 and 250 kilometers further to the northwest in all months cited except for October of 2003 (about 130 kilometers further northwest than in 2002), and October, 2004 (almost 700 kilometers further). Also, in July and August of 2003 and in August of 2004, the amount of both effort and bycatch, as shown by the density of hauls on the maps, increased noticeably in the northwesternmost portions of the fleet’s range compared to the same periods in 2002.

The OKC bycatch decreased in 2004, but it remained almost 50% higher than the average bycatch over the years 1994-2002. In 2002, most of the OKC bycatch occurred in the BSAI sablefish pot and BSAI

longline Pacific cod fisheries, with about 27% of the total OKC bycatch in each of the two fisheries. In 2003 and 2004, however, 94% and 89%, respectively, of the OKC bycatch occurred in the BSAI sablefish pot fishery.

As for the OS bycatch, part of the 2003 increase could be explained by the 28% increase in the overall catch of OS in 2003 compared to 2002 (as reported by the Alaska Department of Fish & Game), which suggests that there simply may have been more salmon available to be caught in 2003. The OS bycatch nearly doubled again in 2004, however, even though the overall catch was essentially unchanged from 2003. The source of the problem is that the regulatory measures implemented to control chum salmon bycatch in the BSAI trawl fisheries (which account for about 95% of salmon bycatch) have not been working. In 1994, the North Pacific Fisheries Management Council and NMFS established the Chum Salmon Savings Area (CSSA) in parts of the Bering Sea and at times when salmon bycatch had been highest based on historical observer data. Unfortunately, in both 2003 and 2004 the highest chum salmon bycatch rates were outside of the CSSA and after its closure. Similar problems occurred in 2003 and 2004 with Chinook salmon bycatch outside of the Chinook Salmon Savings Area—the highest bycatch rates were encountered by the pollock trawl fleet outside of the Savings Area after regulations had forced its closure. The resulting Chinook salmon bycatch was about 28% higher in 2003 and 41% higher in 2004 than the long-term average for the years 1994-2002. To address these problems, the Council is considering other means to control salmon bycatch.

Annual estimates for the years 1994-2002 come from NMFS Alaska Region's blend estimates; 2003-04 estimates are from the Alaska Region's new Catch Accounting System.

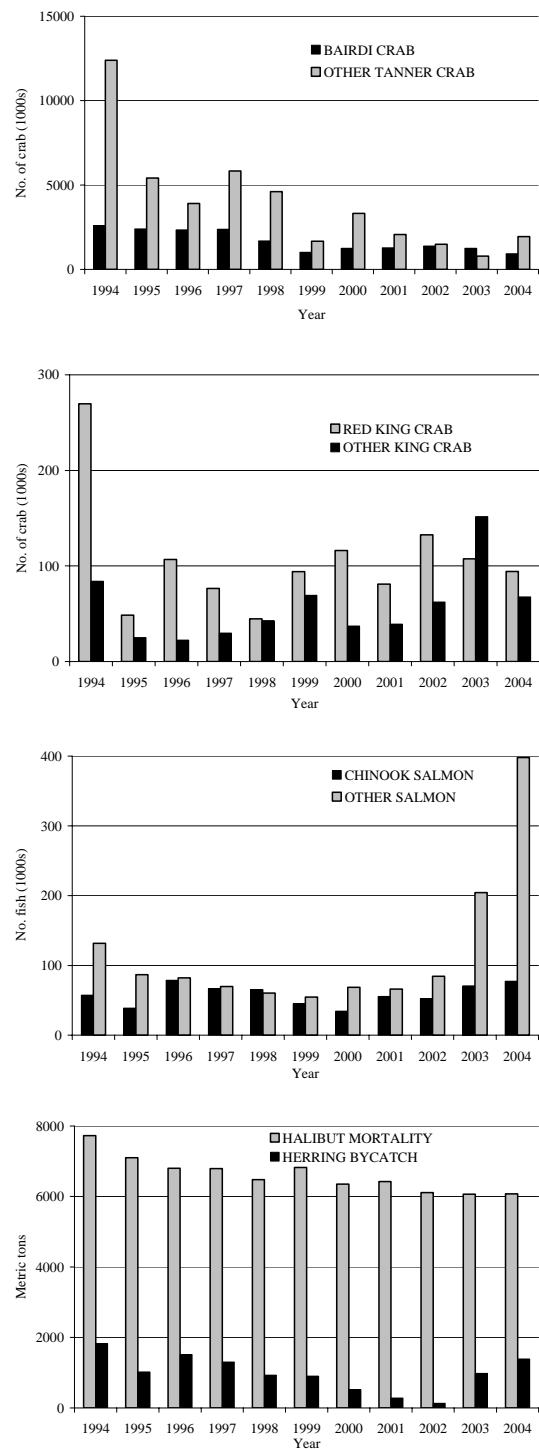


Figure 111. Bycatch of tanner and king crab, salmon, halibut, and herring in groundfish fisheries off Alaska, 1994-2004.